

### Amendments to the Specification

Please amend the paragraph beginning on page 3, line 9, as follows:

An OFDM format for a signal in first and second configurations is shown in Figures 1A and 1B. In the format of Figure 1A, a DFT (or FFT) block 11A is preceded by a cyclic prefix segment 13A that serves as a guard interval for the DFT block. Use of a guard interval, or its equivalent, is required with an OFDM format, in order to account for the possible presence of multipath signals in a received signal. In the format of Figure 1B, a DFT block is followed by a zero-padding segment that also serves as a guard interval for the DFT block.

Please amend the paragraph beginning on page 3, line 16, as follows:

A pseudo-random or pseudo-noise (PN) sequence, a coded m-sequence of symbols, is used in an OFDM format. An m-sequence is a sequence of symbols, usually 0's and 1's, of a selected length that satisfies three requirements: (1) the number of symbols of different types (e.g., the number of 0's and the number of 1's) is "balanced", or approximately the same, over the set of such sequences; (2) the Boolean sum of any two m-sequences, and the result of end-around shifting of symbols in any m-sequence, is again an m-sequence; and (3) the convolution of two m-sequences,  $MS(t;i)$  and  $MS(t;j)$ , satisfies an orthogonality condition:

$$MS(t+\Delta t;i)*MS(t;j) = \delta(\Delta t)\delta(i,j) \quad (1)$$

where  $\delta(\Delta t)$  is a modified delta function ( $\delta(\Delta t) = 0$  for  $|\Delta t| > \Delta t_1$ ) and  $\delta(i,j)$  is a Kronecker delta ( $= 0$  unless  $i = j$ ). The Kronecker delta can be omitted if the m-sequence is independent of the index number  $i$ , or if the index numbers are known to satisfy  $i = j$ . The length of an m-sequence is most conveniently chosen to be  $2^J - 1$ , where  $J$  is a selected positive integer, such as  $J = 7, 8$  or  $9$ .

Please amend the paragraph beginning on page 7, line 5, as follows:

Let  $h(t)$  be a response to transmission of an impulse signal  $\delta(t)$  (modified delta function with infinitesimal width  $\Delta t_1$ ) along the transmission channel TC used for a signal frame. If the signal  $Tr(t)$  is transmitted along the channel TC, a received signal  $Rc(t)$  may be expressed as a convolution of the transmitted signal and the impulse response signal,

$$Rc(t_2) = Tr(t_1) * h(t_2 - t_1), \quad (3)$$

$$Tr(t) = PN(t; i; ideal) + mp(t) \quad (t = (i; Rc) \leq t < t'(i+1; Rc), \quad (4)$$

where \* indicates that a convolution or correlation operation is performed on the two signals  $Tr(t_1)$  and  $h(t_2 - t_1)$ . Because of the orthogonal construction of each PN sequence in Eq. (1), one verifies that

$$PN(t + \Delta t; i; ideal) * PN(t; j; ideal) = \delta(\Delta t) \delta(i, j) \delta(\Delta t) \delta(i, j) \quad (5)$$

$$PN(t + \Delta t; i; ideal) * Rc(t) = \delta(\Delta t) * h(t) + (\text{small residual due to } mp(t)) \quad (6)$$

within a time interval  $t'(i; Rc) \leq t \leq t''(i; Rc)$ , where the Kronecker delta index  $\delta(i, j)$  ( $= 0$  or  $1$ ) can be dropped if the PN sequences  $PN(t; i; ideal)$  are independent of the index  $i$ , or if the particular PN sequence ( $i$ ) is known and  $i = j$ .

Please amend the paragraph beginning on page 9, line 9, as follows:

One method of estimating one or more transmission channel characteristics analyzes the Fourier transform  $FT(f; Rc)$  of a received signal  $Rc(t)$  corresponding to transmission of an impulse function  $h(t)$ . Ideally, the Fourier transform  $FT(f; Rc)$  is approximately a sync function,

$$FT(f; Rc; ideal) = \text{sync}(f/f_0), \quad (10)$$

with an appropriate choice of a reference frequency ~~f~~ representing  $f_0$  representing the bandwidth in the Fourier domain. The deviation of the actual Fourier transform  $FT(f; Rc)$  from the ideal transform  $FT(f; Rc; ideal)$  can be used to estimate one or more (time varying) characteristics for the transmission channel, frame by frame or over a sequence of frames, as desired.